# The Co-operative University College of Kenya

*(A Constituent College of Jomo Kenyatta University of Agriculture & Technology)*

**END OF SEMESTER EXAMINATION - APRIL 2015**

**EXAMINATION FOR THE DGREE OF BACHELOR OF COMMERCE / BACHELOR OF CO-OPERATIVE BUSINESS / BACHELOR OF FINANCE AND INVESTMENT (YR SEM 1)**

**UNIT CODE: CMBC 2107**

**UNIT TITLE: BUSINESS STATISTICS I**

**DATE:** **TIME:**

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**INSTRUCTIONS:**
Answer question **ONE (Compulsory)** and any other **TWO** questions

**QUESTION ONE**
Distinguish between

i) Statistic and parameter (2 marks)
ii) Null hypothesis and alternate hypothesis (2 marks)
iii) Discrete variable and continuous variable (2 marks)
iv) Parametric test and non-parametric test (2 marks)

a) The following distribution gives the profit realized by 100 companies for the year ended 31 December 2014.

| Profit (Sh. "million") | Cumulative Frequency |
|---|---|
| 100 – 120 | 11 |
| 120 – 140 | 28 |
| 140 – 160 | 42 |
| 160 – 180 | 76 |
| 180 – 200 | 88 |
| 200 – 220 | 95 |
| 220 – 240 | 100 |

**Required:**
The mean and standard deviation. (7 marks)

b) The table below reports the annual net salary amounts for an accountant who begun employment with an auditing firm in 2010. In addition, the values of the Consumer Price Index (CPI) for 2010 through 2014 is shown.

| Year | Salary (Sh.) | CPI |
|---|---|---|
| 2010 | 360,000 | 130.7 |
| 2011 | 370,000 | 136.2 |
| 2012 | 390,000 | 140.3 |
| 2013 | 395,000 | 144.5 |
| 2014 | 400,000 | 148.2 |

**Required:**
Determine whether there is a difference in percentage salary increase between 2010 and 2014 in terms of stated (current) shillings amounts and in terms of constant (deflated salary, using CPI) shillings. (5 marks)

c) Prior to the start of delicate wage negotiations in a large company, the unions and the management take independent samples of the workforce and ask them at what percentage level they believe a settlement should be made. The results are as follows:

| **Sample** | **Size** | **Mean** | **Standard Deviation** |
|---|---|---|---|
| Management | 350 | 12.4% | 2.1% |
| Union | 237 | 10.7% | 1.8% |

Assuming that no individual was consulted by both sides, calculate the mean and standard deviation for these 587 workers. (4 marks)

d) The following information relates to the performance of various markets.

| **Market** | **Arithmetic Mean Return (%)** | **Standard Deviation of Return (%)** |
|---|---|---|
| Australia | 5.0 | 13.6 |
| Hong Kong | 9.4 | 22.4 |
| Singapore | 9.3 | 19.2 |
| South Korea | 12.0 | 21.5 |

Using the information in the Table above, address the following:

i) Calculate the coefficient of variation for each market given. (4 marks)

ii) Rank the markets from most risky to least risky using CV as a measure of relative dispersion. (2 marks)

**QUESTION TWO**

a) From the information given about each of the following sets of data, work out the missing values in the table:

| | n | $\sum x$ | $\sum x^2$ | $\bar{x}$ | $s$ |
|---|---|---|---|---|---|
| A | 63 | 7623 | 924800 | | |
| B | | 152.6 | | 10.9 | 1.7 |
| C | 52 | | 57300 | 33 | |
| D | 18 | | | 57 | 4 |

(7 marks)

b) The following table shows the levels of retirement benefits given to a group of workers in a given establishment.

| **Retirement benefits £ '000** | **No of retirees (f)** |
|---|---|
| 20 – 29 | 50 |
| 30 – 39 | 69 |
| 40 – 49 | 70 |
| 50 – 59 | 90 |
| 60 – 69 | 52 |
| 70 – 79 | 40 |
| 80 – 89 | 11 |

**Required:**

i) Determine the interquartile range for the above data (3 marks)
ii) Determine the minimum value for the top twenty per cent (20%) of retirees (5 marks)
iii) Determine the maximum value for the lower 25% of the retirees (5 marks)

**QUESTION FOUR**

a) Prior to an advertising campaign, 35 per cent of a sample of 400 housewives used a certain product. After the campaign, 40 per cent of a second sample of 400 housewives used the same product.

**Required:**

Did the campaign increase sales? (7 marks)

b) A manager is convinced that a new type of machine does not affect production at the company's major shop floor. In order to test this, 12 samples of this week's hourly output is taken and the average production per hour is measured as 1158 with a standard deviation of 71. The output per hour averaged 1196 before the machine was introduced.

**Required:**

Test the manager's conviction (6 marks)

c) Give some examples of the type of data that form a normal distribution. (3 marks)

d) Under what conditions can the normal distribution be used as an approximation to the binomial distribution? (3 marks)

e) What do confidence limits measure? (2 marks

**QUESTION FIVE**

Moving averages are often used in an effort to identify movements in share prices. Approximate monthly closing prices (in Sh. per share) for Toys Children Ltd. for December 2000 through November 2001 are shown below:

| **Month** | | **Price (Sh.)** |
|---|---|---|
| December | 2000 | 40 |
| January | 2001 | 38 |
| February | 2001 | 39 |
| March | 2001 | 41 |
| April | 2001 | 36 |
| May | 2001 | 41 |
| June | 2001 | 34 |
| July | 2001 | 37 |
| August | 2001 | 35 |
| September | 2001 | 37 |
| October | 2001 | 40 |
| November | 2001 | 41 |

**Required:**

a) Use a 3-month moving average to forecast the closing price for December 2001. (5marks)

b) Use a 3-month weighted moving average to forecast the closing price for December 2001. Use weights of 0.4 for most recent period, 0.4 for the second period back and 0.2 for the third period back. (5marks)

c) Use exponential smoothing constant of $\alpha = 0.35$ to forecast the closing price for December 2001. (5marks)

d) Which of the three methods do you prefer? Why? (5marks)